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Children in Different Activities: Child Schooling and Child Labour

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Using primary data from two districts of Pakistan, this article analyses the supply-side determinants of child labour. The study finds that the birth-order of the child has a significant association with schooling and labour decision of child: first school enrolment of children is delayed; there exists gender disparity in favour of male children; the children from female-headed households are more likely to go to school; the education of the head of household has a positive impact on child's schooling; among the parent's parameters mother's education is more important than father's; parental education is positively associated with child schooling and negatively associated with child labour. The ownership of assets impacts the schooling positively, and labour negatively; the household size affects the schooling negatively, and work positively; and household composition also has a significant effect on schooling and child labour. The children from urban areas are more likely to go to school.

INTRODUCTION

According to Child Labour Survey 1996, among the 40 million children aged 5–14 years, 3.3 million, i.e., 8.3 percent are economically active in Pakistan. Out of these, 2.4 million (73 percent of the child labour force) child labourers are boys and 0.9 million (27 percent of the child labour force) are girls.

There is expanding literature on child labour that provides empirical evidence on the nature and determinants of child labour. The previous literature on Pakistani child labour includes Khan (1982); Hussain (1985); Ahmed (1991); Khan and Ali (1991) and Weiner and Noman (1995); and recently Addison, *et al.* (1997); Burki and Fasih (1998); Burki and Shahnaz (2001); Ray (2000); Ray (2000a); Ray (2001) and Ali and Khan (2003). Some studies [see for instance Khan (1982); Ahmed (1991); Chaudhary and Khan (2002)] discuss mainly the qualitative features of child labour. These studies consist largely of case studies interviewing working children. Some literature focuses on the quantitative aspect of child labour. Within the empirical literature on child labour, there has been a shift in emphasis from

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quantification to econometric analysis. An advantage of the econometric analysis, using household surveys, is that these studies offer information on children who do work and do not work, thereby making it possible to investigate the child labour decision by households. The present study is still another effort to analyse child labour econometrically. Many of the previous studies have shown mixed results. This is not so surprising due to the fact that most of these studies have stressed either the male or the female gender; either rural or urban regions; either landowner or landless classes. Or, they have stressed some specific types of child labour, not capturing the full picture. For example, if there are negative effects of an explanatory variable in some sub-groups but not others, aggregation may obscure them. The different definitions of child labour used in some studies also obscure the results.

Ray (2000) shows that child labour takes different forms in different regions; consequently, the policies to reduce it vary within regions. The formulation of policies that are effective in curbing child labour requires an analysis of its key determinants, namely, identification of variables that have a significant effect on child labour. The central motivation of the present study is to analyse the determinants of child labour in the age group of 5–15 years in Pakistan. The point of departure of the present study from its predecessors lies in the use of primary data collected by this researcher. The previous studies, for example Burki and Fasih (1998) used the data from Child Labour Survey 1996 (for the age group of 5–14 years), which was collected by cluster survey, where concentration of child labour existed. Although I have also used the cluster sample technique, the sample was selected so that it consisted of all the households of all income groups regardless of concentration of child labour. Similarly, Ray (2000, 2000a) obtained the data for children in the age group of 10–14 years from Pakistan Integrated Household Survey 1991, and Burki and Shahnaz (2001) used the data for children in the age group of 10–14 years from the Labour Force Survey 1996-97.

OBJECTIVES

The precise objectives of the study are to analyse the supply-side determinants of child labour, i.e., to determine the relation between the decision of the parents (to send their children to school only, to school and work, to work only, or to no school and no work) and four categories of socio-economic variables: child parameters, head of the household parameters, parents parameters, and household parameters. (The parameters have been defined in Table 1.)

METHODOLOGY

Definitions and Instruments. The definition of child is very significant in analysing children's activities. An increase in the age of the child enhances the opportunity cost of education in terms of income forgone, or missing the household chores, due to schooling, although the schooling is the foremost activity in connection with child welfare. Burki and Shahnaz (2001) and Ray (2000, 2000a) have analysed the

child schooling and child labour for the children within the age cohort of 10–14 years as data were available only for this particular age group. The originality of the present study lies in the appropriate definition of child. So a child is defined as a person who is 5–15 years old. Age 15 coincides with the end of school age. Likewise, the cut-off age between infancy and childhood is age 5. Child labour is defined as “the participation of school-age children (5–15 years) in the labour force, i.e., work for wage or in household enterprises to earn a living for themselves or to support household income”.

Income of the household is taken as non-child income of household. This reflects the assumption that decisions on child labour are taken after adult and other non-child earnings are determined. This underlies the ‘Luxury Axiom’ of Basu and Van (1998), namely, that a family will send the child to the labour market only if the family’s income from non-child labour sources drops very low.

Sampling and Data Collection. Cluster sample technique is adopted. Sample of the population, i.e., the Pakpattan and Faisalabad districts are selected purposely. The clusters of the sample are also selected purposely to represent the average conditions of the sample. The households in the cluster comprised all income groups across all walks of life.

Household survey is the main source of data. The mode of data collection used is interviews with the head of the household. The sample observations consist of two thousand households, one thousand from each district.

Model. In order to disentangle the different determinants of child labour and to assess the relative importance of each of the factors influencing child labour decisions, the household decision-making is empirically estimated in the context of a formal analytical model assuming parents’ altruistic behaviour about their children.¹ The households are assumed to use a sequential decision process, keeping the schooling of their children as a priority for the welfare of their children. So, in the study, the decision of child labour is analysed as a sequential decision-making process, using sequential probit model. Burki and Shahnaz (2001) have used the simultaneous approach on Pakistani data arguing that since (i) in the country literacy rate is very low and (ii) unemployment of educated manpower is on the rise, it is too optimistic to assume that Pakistani households are capable of making the hierarchical choice. They also point out that there exists a trade-off between child welfare and the household’s need of income. However, the sequential approach is justified by two points: (i) the sequential model approach has an advantage over the simultaneous approach [Grootaert (1999a)]; (ii) a number of qualitative studies about child labour in Pakistan mention that the majority of the parents of child labourers and child labourers themselves have given first preference to schooling.

In fact, there are advantages and disadvantages to each approach (multinomial logit and sequential probit). The appeal of the multinomial logit approach is that only

¹For parent’s altruism towards children, see Basu and Van (1998).

one equation is needed to be estimated, which by construction will yield a consistent set of probabilities showing the effect of a change in each explanatory variable on the probability of selecting each option. There are several drawbacks. However, the most important is that the multinomial logit model requires the assumption of the independence of irrelevant alternatives, that is, it assumes that the odds ratios derived from the model remain the same, irrespective of the number of choices offered [see Maddala (1983)]. In practice, this assumption is inappropriate when the choices include close substitutes. In the case of child labour, e.g., it requires that the decision-maker view the choices between work and home-care as independent from other options and not affected by whether or not a schooling option is available. Obviously, that is a very unlikely situation. If non-independent choices are included in the multinomial logit model, the model will overestimate the probability for those options.

On balance, sequential approach is selected, and the sequential choices making the welfare of the child are assumed as: (i) schooling, (ii) schooling and work, (iii) work only, and (iv) neither schooling nor work.² This leads to the following four choices, and choice probabilities, to be estimated for each child:

P_1 = Probability to go to school and not to work.

P_2 = Probability to go to school and to work.

P_3 = Probability not to go to school but to work.

P_4 = Probability neither to go to school nor to work.

In the sequential probit model, the probabilities for the four choices are determined as follows:

$$P_1 = f(b_1 X)$$

$$P_2 = [1 - f(b_1 X)] f(b_2 X)$$

$$P_3 = [1 - f(b_1 X)] [1 - f(b_2 X)] f(b_3 X)$$

$$P_4 = [1 - f(b_1 X)] [1 - f(b_2 X)] [1 - f(b_3 X)] f(b_4 X)$$

Where f represents the standard normal distribution function, and b_1, b_2, b_3 and b_4 are vectors of the model parameters. The vector X contains the explanatory variables. Parameters b_1 are estimated over the entire sample. Parameters b_2 are estimated over the sample of children excluding those who go to school only. Parameters b_3 are estimated over the sample of children excluding those who go to school only, and who go to school and work simultaneously. Parameter b_4 are estimates for all the remaining.

Four groups of explanatory variables have been selected as determinants of the child labour on the basis of previous economic literature on child labour [see:

²Although it is considerable that in conservative households the priority choice, particularly for girls, may be 'no school-no work', yet assuming the altruistic model, the households prefer schooling for their children. Many researchers have adopted the same ordering [see, for instance, Burki and Fasih (1998)].

Burki and Fasih (1998); Cartwright (1999); Cartwright and Patrinos (1999); Ray (1999); Grootaert (1999); Ray (2000); Ray (2000a); Maitra and Ray (2000); Sawada and Lokshin (2000); Burki and Shahnaz (2001); Ray (2001); Ali and Khan (2003)].

The definition of the explanatory variables used in the sequential probit model are represented in Table 1.

Table 1

Definition of Dependent and Explanatory Variables

Variables	Definition
Dependent Variables	
P ₁ [Child goes to school only].	• 1 if child goes to school and not to work, 0 otherwise.
P ₂ [Child goes to school as well as to work].	• 1 if child goes to school and to work, 0 otherwise.
P ₃ [Child does not go to school but to work].	• 1 if child does not go to school but to work, 0 otherwise.
P ₄ [Child neither goes to school nor to work].	• 1 if child neither go to school nor to work, 0 otherwise.
Independent Variables	
Bord [Birth order of child].	• Birth order of child among his/her brothers and sisters.
Cgen [Child's gender].	• 1 if child is male, 0 otherwise.
Cage [Child's age].	• Child's age in completed years.
Cagesq [Child's age squared].	• Child's age squared.
Age615 [Child's age for the children in the age group of 6-15 years].	• Child's age in completed years for the children in the age group of 6-15 years.
Cagesq615 [Child's age squared for the children in the age group of 6-15 years].	• Child's age squared for the children in the age group of 6-15 years.
Cedu [Child's education].	• Child's education in completed years of education.
Head of Household's Characteristics	
Hgen [Head of household's gender].	• 1 if head of household is male, 0 otherwise.
Hage [Head of household's age].	• Head of household's age in completed years.
Hagesq [Head of household's age squared].	• Head of household's age squared.
Hedu [Head of household's education].	• Head of household's completed years of education.
Hemp [Head of household's employment].	• 1 if head of household is employed, 0 otherwise.
Hy [Head of household's income].	• Head of household's income per month in rupees.
Parent Characteristics	
Fedu [Father's education].	• Father's education in completed years of education.
Femp [Father's employment].	• 1 if father is employed, 0 otherwise.
Fy [Father's income].	• Father's income per month in Rupees.
Medu [Mother's education].	• Mother's completed years of education.
Memp [Mother's employment].	• 1 if mother is employed, 0 otherwise.
My [Mother's income].	• Mother's income per month in Rupees.
Household Characteristics	
Asst [Household's ownership of assets].	• 1 if the household has ownership of assets, 0 otherwise.
Pcexp [Per capita expenditure of household].	• Household's per capita expenditure in Rupees per month.
Fmsiz [Household family size].	• Number of household members.
Child 04	• Number of children ages 4 or less than 4 years in the household.
Child 015	• Number of children ages 15 or less than 15 years in the household.
Boy 16	• Number of male siblings of 16 years of age or above in the household.
Girl 16	• Number of female siblings of 16 years of age or above in the household.
Loc	• 1 if household is urban, 0 otherwise.

RESULTS AND DISCUSSION

The mean and standard deviations of the explanatory variables are shown in Table 2. The sequential probit results are presented in Table 3 for the children age 5–15 years. The table reports the probability derivatives of the parameter estimates, computed at the means of the explanatory variables. These derivatives show the percentage point change in probability for a one unit increase at the mean of a given explanatory variable holding all other variables constant at the mean. In the parentheses the *t*-statistics are shown. The majority of the results are consistent with the theoretical implications of child labour.

The first-stage results show the probability of going to school and not to work. The second estimation stage eliminates from the sample the children who go to school only. The probability to be determined for the remaining sample is that of combining school and work. The third stage of the estimation looks only at the children who are not in school and determines the probability that they will work for wages or in household enterprises rather than home-care task or do not go to school and do not work at all.

Birth-order. In the economic literature there is no consensus about whether the birth-order effect on child schooling and labour really exists, and if it exists at all, whether it is positive, negative, or non-linear in form [Parish and Willis (1993)]. There are two possible cases [Behrman and Taubman (1986)]. In the first case, there may be a negative birth-order effect. As more children are born, the household resource constraint becomes severe and fewer resources are available per child. If per child resource shrinkage effect is dominant, the younger (high birth-order) children receive less education than other siblings. In the second case, the resource competition effects might decline over time, since household can accumulate assets and increase income over time and the older children may enter the labour market, contributing to household resources. This may be a positive birth-order effect and younger children may spend more years at school. Moreover, the economy of scale in household-level public goods may equally be important, since younger children can learn easily from the experience of their older siblings through home teaching. So, older siblings might promote the education of younger children, rather than impede the education of those children. If the resource extension and economies of scale effect and externalities are larger than the competition effect, the birth-order effect again will be positive. There is another explanation of positive birth-order effect, that is, children may be required to perform household chores and related tasks, and older children are more likely to have to forgo some years of education than younger children in the family [see, Sathar (1993)]. As Sathar and Kazi (1990) found, for example, in Karachi, employed women rely more on their eldest daughters to fulfil household obligations. Present research suggests that birth-order exists and, more importantly, it is negative for school-only decision. The birth-order of a child among his/her brothers and sisters shows that the younger brothers and sisters have

Table 2

Summary Statistics of Variables (Means and Standard Deviations)

Variables	Children Going to School Only	Children Going to School as well as to Work	Child not Going to School but to Work	Child Neither Goes to School Nor to Work
Child Characteristics				
Bord	2.2222 [1.2163]	1.6400 [0.8980]	2.1186 [1.2468]	2.6307 [1.3757]
Cgen	0.5883 [0.8273]	0.7600 [0.4314]	0.5593 [0.5007]	0.4461 [0.5009]
Cage	9.7481 [3.1009]	12.8600 [2.2678]	11.0847 [2.7435]	8.6615 [3.4788]
Cagesq	104.61 [62.0636]	170.42 [53.7492]	130.2711 [56.7896]	86.9384 [67.7511]
Cage615	10.2320 [2.8354]	13.6321 [2.9231]	12.9640 [2.3642]	9.8662 [2.9421]
Cage615sq	100.29 [58.7974]	186.43 [62.3489]	168.7349 [71.0984]	101.3862 [63.6734]
Cedu	3.1041 [3.1098]	4.3800 [2.4980]	0.9235 [1.9681]	0.7254 [1.2371]
Head of Household Characteristics				
Hgen	0.9951 [0.0695]	0.9301 [0.0345]	0.9931 [0.0078]	0.9846 [9.1420]
Hage	42.7312 [8.5739]	46.2000 [8.5475]	45.4745 [9.4126]	41.9846 [9.1420]
Hagesq	1899.29 [748.77]	2206.04 [823.53]	2155.03 [951.48]	1845.00 [808.13]
Hedu	5.4285 [6.0441]	3.6600 [3.9362]	0.6440 [1.4234]	0.9076 [2.4541]
Hemp	0.8765 [0.3293]	0.8300 [0.4329]	0.5932 [0.4954]	0.8307 [0.3778]
Hy	4366.76 [6941.03]	2152.00 [1280.18]	1316.94 [941.96]	1821.53 [1189.99]
Parent Characteristics				
Fedu	5.4188 [6.5207]	3.6600 [3.9362]	0.6440 [1.4234]	0.9076 [2.4541]
Femp	0.8765 [0.3293]	0.9801 [0.0045]	0.5932 [0.4954]	0.8307 [0.3778]
Fy	4613.19 [7636.77]	2152.00 [1280.18]	1232.20 [575.48]	1752.30 [991.85]
Medu	4.6247 [6.2108]	1.4600 [2.9291]	0.1186 [0.9113]	0.1236 [0.8321]
Memp	0.8813 [0.3237]	0.9400 [0.2399]	0.6610 [0.4774]	0.8307 [0.3778]
My	2180.87 [2317.06]	780.00 [875.86]	616.94 [621.77]	707.69 [698.95]
Household Characteristics				
Asst	0.7748 [0.4182]	0.8669 [0.3505]	0.5254 [0.5036]	0.5692 [0.4990]
Pcexp	1260.08 [2317.06]	493.17 [326.32]	296.93 [214.90]	382.06 [245.84]
Fmsiz	6.9588 [1.8396]	7.2600 [1.4258]	7.4915 [1.7555]	7.5230 [2.0999]
Child015	3.9661 [1.5930]	3.8800 [1.5069]	4.5423 [1.6228]	4.6461 [1.8576]
Child04	0.4987 [0.7023]	0.3200 [0.5510]	0.5423 [0.6777]	0.8307 [0.8398]
Boy16	0.4285 [0.7226]	0.6600 [0.8478]	0.5832 [0.7836]	0.4912 [0.8823]
Girl16	0.3414 [0.6325]	0.5600 [0.7602]	0.4942 [0.7962]	0.5554 [0.6359]
Loc	0.6369 [0.5921]	0.4962 [0.5245]	0.6779 [0.4712]	0.4153 [0.4966]

Table 3

Sequential Probit Results for (5–15 Years) Children

Variables	<i>First Stage</i>	<i>Second Stage</i>	<i>Third Stage</i>	<i>Fourth Stage</i>
	$P_1 =$	$P_2 =$	$P_3 =$	$P_4 =$
	Probability	Probability	Probability	Probability
	that the Child Goes to School Only	that the Child Goes to School as well as to Work	that the Child does not Go to School but to Work	that the Child Neither Goes to School Nor to Work
Constant	–1.3332 [–2.0325]	0.1644 [0.5918]	–0.9007 [–1.5953]	0.9981 [1.7912]
Child Characteristics				
Bord	–0.0437 [–1.3058]**	0.0071 [1.6838]*	–0.0172 [1.5307]*	0.0109 [1.3067]**
Cgen	0.0206 [–1.8858]*	0.0127 [1.7248]*	0.0385 [1.7140]*	–0.0968 [–1.7486]*
Cage	0.1437 [3.8714]*	–0.0180 [–2.3050]*	0.0857 [1.5235]**	–0.1578 [–2.8016]*
Cagesq	–0.8167 [–4.8016]*	0.0003 [2.2734]*	–0.0025 [–1.9430]*	0.0085 [2.9817]*
Cage615	–0.1192 [–3.8611]*	0.1248 [2.9879]*	0.1156 [4.2147]*	–0.0932 [–2.8197]*
Cage615sq	–0.0693 [–4.2143]*	–0.0366 [–3.1426]*	–0.0920 [–3.9643]*	0.0629 [2.8152]*
Cedu	0.0668 [4.4987]*	0.0216 [3.1991]*	–0.0423 [–3.3050]*	–0.0714 [–3.7828]*
Head of Household Characteristics				
Hgen	–0.1745 [–1.4406]**	–0.0076 [–0.0061]	0.0392 [1.3136]**	–0.0132 [–1.6664]*
Hage	0.0271 [1.9828]*	–0.0059 [–1.7010]*	0.0106 [1.6842]*	–0.0220 [–1.6814]*
Hagesq	–0.0001 [–1.6454]*	0.0000 [0.7250]	–0.0000 [–0.2261]	0.0001 [0.9098]
Hedu	1.1230 [1.8159]*	–0.1068 [–1.6632]*	–0.1058 [–1.7058]*	–0.1807 [–1.6714]*
Hemp	–0.0480 [–4.9820]*	0.0216 [0.3664]	–0.1650 [–1.5153]**	0.0944 [0.7943]
Hy	0.0000 [1.4264]**	–8.2585 [–0.4492]	–0.0000 [–1.5979]**	0.0000 [0.9174]

Continued—

Table 3—(Continued)

Parent Characteristics				
Fedu	0.0914 [1.7902]*	0.0996 [0.4135]	1.0538 [0.7280]	0.9603 [0.6574]
Femp	0.0001 [0.3211]	0.0000 [0.0102]	0.0000 [0]	0.0069 [0.9641]
Fy	0.0099 [0.5621]	0.0000 [0]	0.0042 [0.1936]	0.0000 [0]
Medu	0.1184 [1.9127]*	−0.0031 [−1.4739]**	−0.0382 [−1.8414]*	−0.0202 [−1.7024]*
Memp	0.1583 [1.7590]*	−0.0375 [−1.0144]	−0.0145 [−0.1276]	0.0561 [0.4911]
My	−0.0000 [−0.7255]	−0.0000 [−1.1485]	0.0001 [2.0916]	8.1654 [0.1270]
Household Characteristics				
Asst	0.0690 [1.3749]**	0.0239 [1.5586]**	−0.0411 [−1.8093]*	0.0447 [1.8851]*
Pcexp	0.0001 [1.3632]**	0.0000 [0.4779]	0.0001 [0.8129]	−0.0012 [−1.7545]*
Fmsiz	−0.0531 [−1.7965]*	−0.0214 [−1.6329]**	0.0172 [1.2850]**	0.0725 [1.2903]**
Child015	−0.0087 [−0.1913]	−0.0311 [−1.9160]*	−0.0224 [−1.1813]	0.0756 [1.9880]*
Child04	0.0850 [1.0247]	0.0447 [0.9263]	−0.0224 [−0.2679]	−0.1257 [−1.6500]*
Boy16	0.0242 [1.2979]**	0.0278 [0.8566]	−0.0118 [−0.0286]	−0.1029 [−1.3463]**
Girl16	0.0887 [1.3979]**	0.0099 [0.4360]	−0.0020 [−0.0286]	−0.1201 [−1.9232]*
Loc	0.1573 [1.3225]**	−0.0136 [−0.9334]	0.0936 [0.0281]	−0.0197 [−0.0357]
Log of Likelihood Function	−1822.52	−674.36	−1281.12	−1986
No. of Observations	3868	1069	3054	3993
R-Squared	0.6954	0.5907	0.6352	0.5989
Percent Correct Predictions	0.8962	0.8321	0.9336	0.8789

* Indicates significant at 5 percent level.

** Indicates significant at 10 percent level.

lower probability to go to school. This may be due to the resource constraint effect, but another possible explanation may be the delayed first enrolment of children in school. As the age of children in the survey is 5–15 years, and there exist few facilities for pre-schooling in Pakistan, so usually the children enrolment is delayed. A number of studies [see, for instance, Sawada and Lokshin (2000)] confirm the phenomenon of delayed school enrolment in Pakistan. The provision of pre-schooling facilities is recommended in policy formulation, which ultimately may enhance the child schooling in the country.

In the second-stage results, it is found that the younger children are more likely to combine schooling with work. The result counters what one would expect, that elder children are more likely to combine school and work.

The birth-order of the child is negatively related to work-only, i.e., the younger the child among the brothers and sisters, the less likely it is to do work only. Child participation in wage or household enterprises increases with child's age [see also Durrant (1998); Ray (2001)]. Such relation shows the drop-out of children from school in higher grades. There may be a number of reasons for the phenomenon, namely, as the age of the child increases, the opportunity cost of child education increases; by increase in age, the school grade increases, and consequently the education cost also increases; for higher grades, there are fewer schools as compared to lower-grade schools; the girls' drop-out rate is higher than boys' in higher grades due to social and cultural discrimination, etc.

The no-school, no-work or home-care activity decision is positively related to the birth-order of the child. The higher the birth-order of the child, that is, the younger the child among brothers and sisters, the more likely it is to be in the state of no-school and no-work. It explains the fact of delayed first school enrolment as the younger children remain at home. The result is corroborated by the summary statistics, i.e., the mean of the birth-order of home-care children is the highest in all the four categories of child activities (schooling, combining school and work, work only, no-school and no-work), so the younger children among their brothers and sisters are more likely to remain in no-school, no-work activity. Similarly, no-school no-work or the home-care is negatively related to the age of the child. The older the child, the less likely it is to do home-care or remain in no-school, no-work situation.

Gender of the Child. In the context of Pakistan, the gender of the child is one of the most important characteristics affecting child schooling [Sathar (1993)]. The present study finds that the male children are more likely to go to school as compared to female children. This provides confirmation of results by Durrant (1998); Sawada and Lokshin (2000); Burki and Shahnaz (2001), and Ray (2001). There are several possible explanations for the distinct gender gap. The lack of female schools, particularly in rural areas, explains the result. Sawada and Lokshin (2000) have described that the high opportunity cost of daughters' education in Pakistan may lead to apparent intra-household discrimination against girls in terms

of education. Because of the custom of seclusion of women, parents might have a strong negative perception of female education. The low probability for girls' schooling may also reflect the low female teacher availability and poor teaching standards in schools [Sathar (1993)]. The traditional and socio-cultural forces create the need for women teachers to teach girls. So it requires single sex schools. The non-availability of separate schools keeps the girls' schooling low. Moreover, lack of school availability affects female education more seriously than male education [Shah (1986)]. The low attendance among girls is also an outcome of strict restrictions on their movement outside the home, specifically in rural areas, after they reach puberty. The parents perceive girls' education as less advantageous, and there is a high drop-out rate of girls in school. There may be a case of selective allocation of resources where girls might enter school but are not able to remain there for a long duration, presumably because their brothers get preferential treatment [see Emerson and Portela (2001) for Brazil]. Gender has a strong influence in rural areas of Pakistan. Being a girl in rural Pakistan reduces the chances of attending school [Sathar (1993)].

The gender of the child also matters in combining school and work, and boys are more likely to combine school with work. It is corroborated by the summary statistics in Table 2. The mean of the gender of the child in the activity of combining school with work is 76, i.e., boys are found to be more prone to combine school with work as compared to girls. Moreover, boys are more likely to be in work-only category than girls. In the fourth stage, it is found that girls are 9.6 percent more likely to do home-care as compared to boys. The possible arrangement consistent with these findings is that parents anticipate relatively higher returns from boys' work and at the same time assign household work activities to daughters due to social norms.

Age of the Child. The age of child is an important parameter for the decision of child schooling and child labour. The probability derivative of age is found to be positive, that is, child schooling increases with age. The result matches with that of Burki and Fasih (1998), but it is opposed to the general perception that school participation decreases by an increase in age [see Illahi (2001)]. It signifies that child enrolment is delayed. I have taken the minimum age of child to be in school as 5 years. At this age the children are not sent to school; that is the explanation of positive probability. In Pakistani rural areas [see, Ali and Khan (2003)] and in urban areas [see, Ali and Khan (2004)] the school enrolment is delayed. So regardless of the rural or urban areas, the school enrolment of children is delayed at the national level. The negative sign of age squared shows that the probability of going to school increases at a decreasing rate. It suggests an inverted U-shaped (\cap) relationship between age and child schooling. The decrease in schooling at later age of children reflects the increase in forgone earnings with age. As the child grows older, the potential of earnings increases. Therefore, he/she is pulled out of school.

The focus of the study is activities of the children in the age group of 5–15 years. It is found that first enrolment of children is delayed and the parents do not send their children to school at the age of five. I have also taken the children in the age group of 6–15 years to see what happens to the child's schooling by increase in the age of child after enrolment. In this age group, the age of the child has shown a negative impact on the child's schooling. Probability for the child to go to school decreases at the decreasing rate.

The child's age matters in the decision to allow him/her to combine schooling and work, and the probability of the child to combine schooling and work decreases with age. The positive age squared suggests, however, that the effect becomes stronger in the higher age group. Maitra and Ray (2000) found that, for Pakistan, age increases the likelihood that the child either goes to school-only or work-only. Age of the child has a positive impact on work decision: the older the child, the more probable he/she is to go to work.

It is found in the fourth-stage results that home-care activity is negatively related to the age of the child (for the age cohort of 5–15 years). The older the child is, the less likely it is for him/her to do home-care. Each additional year of age of child decreases the likelihood of his or her doing home-care by 15.7 percent. It is estimated in the third-stage results that the increase in age enhances the probability for work only. Similarly, the increase in the age of the child enhances school participation (first-stage results). The notion supports the fact that as the age of the child increases, either she/he will go to school or to work, instead of doing home-care. For the children in the age group of 6–15 years, each additional year of child's age decreases the likelihood for home-care by 9.3 percent at an increasing rate. It decreases the school participation as well (first-stage results) and increases the labour force participation (third-stage results). It means that as the age of the child increases, most probably she/he will go to work.

Educational Level of Child. The current years of education of child increase the probability to combine school and work. It shows that a child has to work to meet his educational expenditures. As the education level increases, the educational cost increases, so the probability to combine schooling and work increases. The result supports the findings of Ali and Khan (2003) for rural areas of Pakistan.

Each additional year of education of the child decreases the probability to work by 4.2 percent. So it may be concluded that work is the flip side of schooling. Similarly, each additional year of education of the child decreases the likelihood to opt either school or work by 7.1 percent.

As a policy matter an increase in the provision of schooling opportunities may decrease the child labour as well as no-school, no-work activity of the children. The increase in school enrolment by policy implementation will put the children of the category of no-school, no-work/home-care into the school category more intensively, rather than among working children. It is further supported by the summary statistics

in Table 2, as mean years of schooling of working children are the second lowest and those of home-care children are the lowest in all categories of children. As more girls are engaged in home-care activity, they will be the bigger beneficiaries of such a shift in school enrolment policy.

Gender of the Head of Household. The parameters of head of the household are critical in determining the child labour decision. I capture gender and vulnerability indicators by using a dummy for female headship. Though the concept of female headship has come under a lot of criticism for not adequately identifying gender vulnerability, it remains the most useful single indicator in the absence of anything better [see Rosenhouse (1989); Mason and Lampietti (1998)]. Ray (2000) notes that female-headed households are more vulnerable to poverty and are much more dependent on children's earnings than male-headed households. So the probability of working children coming from female-headed homes is high. Psacharopoulos (1997) finds that the probability of a working child is higher in female-headed households in Bolivia. On the other hand, Canagarajah and Coulombe (1998) find that children from female-headed households are more likely to go to school in Ghana. Maitra and Ray (2000) find for Pakistan that gender of the head of the households does not matter in the schooling decision of children. Ali and Khan (2003) find that in the rural areas of Pakistan, children from male-headed household are less likely to go to school. This makes the impact of the gender of the head of the household on schooling decision in Pakistan as well as other countries ambiguous in economic literature. My objective in including the gender of the headship as an indicator of gender vulnerability and female decision-making is to see if children's time allocation in such households is significantly different from their counterparts' in male-headed households. I find that children from male-headed households have 17 percent lower propensity for school [see also Burki and Shahnaz (2001)].

The study supports an interesting relationship between gender of the head of household and work decision of children. The children from male-headed households are 4 percent more likely to go for work. It means that despite the lower socio-economic status of female heads (normally mothers), females are good household managers regarding children's education. The phenomenon may be viewed from another angle: Why does the female head of household not take other options for her children? Are female heads of households unable to take other options and are under compulsion to send their children to school? The usual inverse of schooling is work, apprenticeship or work at household enterprises, but these options require either physical capital or social capital which poor female heads rarely have. So the only option remaining is to send the children to school.

The children from female-headed households are 1.3 percent more likely to take home-care. Here an economic factor is involved. The female heads have to participate in out-of-home economic activities to support the family. So children (specifically girls) have to remain at home for domestic chores. Moreover, the

female heads have lower social capital, so they have lower probability to engage their children in apprenticeship, training, or learning by doing activity. On the other hand, the male heads of households have comparatively more economic opportunities and social capital. So the children from the male-headed households have 4 percent more access to work.

Age of the Head of Household. The stage in the lifecycle of the head of the household has shown a positive effect on children's schooling. The probability of a child's going to school increases by an increase in the age of the head of the household at a decreasing rate. The older the head of the household, the more likely it is that the child attends school only. The possible explanation is economic in nature. By increase in age, the skill and experience of the head of the household expands. So his or her increased earning capacity makes the household economically more viable, and the head of the household therefore decides to send the children to school. On the same lines, the older head of the household has comparatively older children (more than 15 years of age) as compared to a younger head of the household. These older siblings have an earning capacity (older siblings are more likely to work—third-stage result of birth-order parameter of child). So the financial status of the household is enhanced, and as a result school-age children are more likely to go to school. Furthermore, if the head of the household is older, who is often father or mother of the children, and the older siblings (more than 15 years of age) are studying instead of earning, the children in the school-going age are more likely to go to school on account of economies of scale of education within the household. Another explanation may be the increased awareness about the advantages of education with every additional year in age.

Lifecycle of the head of the household has shown a negative effect at second-stage and a positive effect at third-stage of results. The more the age of the head of household, the less likely for the child to combine school with work and the more likely for the child to work. The children from households with older heads of households are less likely to engage in home-care/neither-school nor-work activity, but they are more likely to go to school-only or work-only. The intra-comparison between the probabilities to go to school and to work makes clear that the child will more probably go to school.

Education of the Head of Household. It is generally perceived that the education of the head of the household plays a positive role in the child's probability to go to school. For instance, Ali and Khan (2003) find that in the rural areas of Pakistan, the probability of a child's going to school increases by 9.7 percent by an increase of one year of schooling of the head of household on average. This indicates an important complementarity between the education of the head of the household and the child's schooling. This complementarity is generated possibly by an educated parent's improved technical or allocative efficiency, his superior home teaching environment, and his feeling an incentive in educating children [Behrman,

et al. (2000)]. I find that there exists a positive relation between the educational level of the head of the household and the child's schooling. One additional year of education of the head of the household increases the chances of the child's schooling by 12 percent [see also Burki and Shahnaz (2001) for such type of results]. It is further supported by results of summary statistics, i.e., the mean of the years of education of the head of household of school-going children is the highest in all categories of the heads of households (heads of households of school-going children, heads of households of children combining school and work, heads of households of child labourers, and heads of households of home-care children). On the other hand, the heads of households of child labour-producing households have the lowest level of education (see Table 2).

Education of the head of the household has shown significant and negative impact on child's work. On average, one additional year of education of the head of the household decreases the probability of the child's going to work by 10.5 percent. The explanation is that the educated head of household distinctly perceives the disadvantages of work and benefits of education.

The education of the head of the household decreases the likelihood that the child will be engaged in work-only and home-care. Each additional year of education of the head of the household decreases the likelihood of the child's going to work-only and home-care by 10 and 18 percent respectively.

Employment Status and Income of the Head of the Household. Some studies [see, for instance, Ali and Khan (2003) for the rural areas of Pakistan] find that the employment status of the head of the household affects schooling positively. It highlights the fact that an unemployed head of the household cannot insure himself against income fluctuations, which creates supply of child labour from the household. Burki and Shahnaz (2001) find that the employment status of the head of the household does not influence the schooling or work choices of children. But the present study shows the surprising results, i.e., the children of the employed heads of households are 4.8 percent less likely to go to school. On the other hand, they are 16.5 percent less likely to work. Moreover, the income level of the head of the household does not matter in the schooling decision.

Similarly, both employment level and income level of the head of the household have a negative impact on child's work. As the head of the household is the major contributor to household income, his employment makes the household income stable and reduces the need for child labour. At the same time, the increase in income of the head of the household decreases the probability for the child to work [see also Ali and Khan (2003)]. In other words, the decline in poverty reduces child labour. The results from summary statistics confirm the finding that the income level of the head of the household has a negative impact on child's work, as the income of the head of the household in the child labour-producing households is the lowest as compared to that of other groups of households (households producing school-going

children, households producing part-time labourers, households producing full-time labourers, households producing home-care children).

Parental Education, Employment, and Income. It is unequivocally brought out in the economic literature that there is a strong link between parental education and likelihood of child schooling [see, Emerson and Portela (2001)]. Parents who have themselves been to school are presumably more likely to invest in the education of their children. It is evident from the summary statistics of the present study that the school-going children have parents with more years of education on average as compared to the children involved in other activities. I find that father's education has a positive effect on child's schooling. One additional year of education of father increases the probability of child's schooling by 9.1 percent. It provides strong evidence of inter-generational persistence of illiteracy, as well as child labour among such illiterate families. The fathers who are less educated invest less in their children's education, thereby keeping them illiterate. The finding is consistent with the results of a number of studies [see, for instance, Bell and Gersbach (2000); Dessy (2000); Emerson and Portela (2000)]. But father's employment and income does not matter regarding child's schooling.

Mother's education has a positive effect on child's schooling, as one additional year of the education of mother increases the child's school participation by 11.8 percent. It is concluded that in Pakistan the impact of mother's education on child's schooling seems stronger than that of father's education [see also Sathar (1993); Burki and Shahnaz (2001)].

The more educated women perceive their children's education positively and decide to send their children to school-only, but not to work, and not to remain in the state of no-school and no-work. The mother's employment results in 16 percent more probability for the child to go to school. It may also be concluded that educated working women perceive education positively on the basis of financial returns to education, as they themselves have gained these returns.

Mother's education is negatively related to the decision to combine school and work and work-only. One additional year of education of mother decreases the child's probability to work by an almost 4 percent. Similarly, it is negatively related to no-school, no-work decision. So it is concluded that mother's education supports child's schooling and depresses the child's work and home-care. It supports the general perception that parental education is associated with a lower incidence of child labour and a higher school attendance rate. The education of parents influences child schooling through their favourable attitude towards child schooling.

The father's employment, and father's and mother's income do not matter in child's schooling. Among the parent's parameters, education is a significant factor for child's schooling and child labour. Adult education, therefore, stands prominently among the policy proposals.

The child labour literature [see, Basu and Van (1998); Dessy (2000); Emerson and Portela (2000); Baland and Robinson (2000); Bell and Gersbach (2000)] generally assumes that parents have common preferences for their children. But the present study suggests that fathers and mothers have different impacts on the children's activities. This is potentially related to their relative bargaining power [see also Basu (2001); Ridao-Cano (2000)]. Moreover, it supports the rejection of the unitary family model that assumes that parents have common preferences for their children and pool their resources.

Assets. Conceptually, it is believed that children from asset-rich households are more likely to go to school or less likely to work than from asset-poor households. Bhalotra and Heady (2001) find that large holdings by the household increase the probability of child work and decrease child's probability to attend school. They term it as "wealth paradox". The wealth paradox seems more evident for Pakistani rural girls than for boys, i.e., daughters of land-rich households are more likely to work than are the daughters of land-poor households. The paradoxical pattern is weak for boys. The available theoretical and empirical literature on child labour does not satisfactorily explain the wealth paradox. The theoretical literature on child labour has emphasised credit market imperfection as a possible explanation of the wealth paradox [see, for example, Ranjan (1999); Jafarey and Lahiri (2002)]. Bhalotra and Heady (2001) also emphasise that labour market failure may account for the wealth paradox. I find that if the household has assets, the child has 6.9 percent more probability to go to school-only. The ownership of assets, like a household enterprise, house, land, agricultural machinery and instruments, shop, etc., is an obvious measure of a household's wealth. Hence the results suggest that the probability of child's schooling is systematically higher for households with wealth. Moreover, ownership of assets makes the household stable against the fluctuations in income through credit procurement or sale of the assets. The household with holdings may easily afford to hire wage labour instead of drawing children out of school and involving them in work [see Sathar (1993)]. Another model of child labour include household assets, i.e., human capital, physical assets (land, dwelling, farm implements, durable goods) and financial savings and finds that the ownership of assets leads to a significantly higher probability of school attendance [Jenson and Neilsen (1997)].

In the second-stage results, the presence of assets in the household has shown a positive impact on child's activity of combining school and work. If the household has assets, it is 2.3 percent more likely for the child to combine school and work, but the probability of going to school-only is still higher.

The ownership of assets has shown a negative impact on the decision of the parents to send their children to work-only. The possible explanation may be that the presence of assets in a household increases the financial status of the household, and decreases the fluctuation in the income of the household. So a household owning

assets does not rely on child labour. Furthermore, in such households, the education cost is easily affordable. The result is contradicted by Ali and Khan (2003) for the rural areas of Pakistan; they find a positive impact of ownership of assets on child labour, showing a complementarity between assets and child labour. They explain the phenomenon that the presence of family enterprises makes it easier for families to put their children to work. Another study argues that a family may only be able to use assets if their children work [Brown (2001), p. 9].

The ownership of assets by the household decreases the probability for the children to do home-care. The children from the households with ownership of assets are 4.4 percent more likely to do home-care. The children from households with assets either go to school (evident from the first-stage result) or combine school with work (from the second-stage results). When the assets increase, the income of the household increases and the household decides to send its children to school. They combine school with work because they have the opportunity for it on account of ownership of physical capital assets. They do not go for work (from the third-stage results) because the households have enough income from the assets, so the children are not required to work. *It seems that the children from the households with ownership of assets should not be involved in home-care. The adoption of home-care activity reveals many loopholes in the schooling system.* Although the parents of households with assets have the capacity to finance schooling, yet they keep them in home-care. The reasons may be problems with the schooling system, such as the low quality of education, irrelevant education, no financial returns to education, or bored/boring or dull education, harsh attitude of teachers, teacher's absenteeism, etc. It means the deficiencies in the educational system cause the low school enrolment from these households.

Per Capita Income of the Household. Per capita income of the household is an important explanatory variable from the point of view of policy option to eliminate child labour. Per capita income of the household represents the poverty level of the household. If it is assumed that there exists a positive relation between per capita income and schooling of children, and a negative relation between per capita income and child labour, i.e., poverty compels the parents to get their children drop out of school and send them to work, then in such situations the interventions like trade sanctions or bans on child labour and legal interventions in schooling and child labour will tend to further impoverish the already poor households. Secondly, any intervention in the education sector is likely to be limited in its scope and effect unless the opportunity cost of sending children to school is lowered. The most puzzling feature in this area, emerging from a review of empirical research, is that income effect on child labour differs across studies. An insignificant effect is reported by Coulombe [(1998) for Cote d' Ivoire], Illahi [(2001) for rural boys in Peru] and Ray [(2000a) for Pakistan]. A positive coefficient on income is obtained by Cartwright [(1999) household farm/enterprise work for Colombia] and Patrinos

and Psacharopoulos [(1994) for Paraguay]. Negative income effects are found in Cartwright [(1999) wage work for rural Colombia], Cigno and Rosati [(2000) for rural India] and Ray [(2000) for Peru]. In my study, per capita income seems to influence the activities of children by increasing the likelihood of schooling. It is corroborated by the results of summary statistics: school-going children belong to households having a comparatively higher per capita household income, while the working children belong to households with a lower per capita income. The per capita income of the household is negatively related to no-school, no-work decision, that is, the children from poor households are less likely to live in no-school, no-work status. Due to poverty, the poor parents cannot send their children to school but engage them in work, as they can not afford to keep their children in no-school, no-work situation for any considerable length of time.

Household Size and Composition. The considerations leading to children's attending school are influenced by the number of persons required by each household to perform various household chores to supplement household income. In this regard, the household size and composition may be quite crucial for determining the required household labour. In the context of Pakistan, I find that the household size and composition exerts an impact on child's schooling. From the quantitative results, it is evident that the families of school-going children have the lowest number of family members on average in all categories of households (households producing school-going children, households producing part-time child labourers, households producing child labour, and households producing home-care children). Similarly, school-going children belong to families in which the number of children (up to 15 years) is comparatively lower than in families producing child labour or home-care children. From the econometric results, the larger household size reduces the propensity to go to school. One additional member of the household reduces the likelihood of schooling of children by 5.3 percent. Even it reduces the likelihood of combining school and work by 2.1 percent. On the other hand, an incremental change in family size increases the work probability by 1.7 percent, and home-care probability by 7.2 percent.

As concerns the number of children (up to the age of 15 years) in the household, it has a negative effect on schooling. The explanation, as given by Ray [(2001), p. 10], is that a child living in a household containing a large number of children is more likely to be living in poverty than a child residing in a household with a few children. Sawada and Lokshin [(2000), p. 15] had similar results; that students who could obtain higher education are from households with a smaller number of children. This is a reflection of the intra-household resource competition. Sathar (1993) also states that children from households with a large number of siblings are more likely to drop out.

The larger number of children (up to the age of 15 years) in the household decreases the probability for the school-age child to combine school and work as

well as to go for work-only. On the other hand, larger number of such children increases their probability to do home-care. But the number of infants, i.e., siblings less than five years of age, increases the probability for the children to combine school and work. It reveals the resource competition effect.

The presence of prime-age (more than 15 years) male and female siblings (separately) in the household influences the propensity for the child to go to school positively. The explanation is that these siblings lower the need for household working time and free the school-age children to go to school. The presence of female siblings has more impact as compared to male siblings on the decision to send children to school. The number of these siblings decreases the probability to do home-care, and here again the impact of female children is higher. It supports the view that prime-age siblings replace the school-age children in home-care activity.

Locality of the Household. The rural or urban location of the household has a fairly strong effect on the schooling of children. I find that children from the urban areas are 15.73 percent more likely to go to school than those from the rural areas [see also Burki and Shahnaz (2001)]. The finding corroborates the figures of school enrolment at the national level, for both the urban and the rural areas.

SUMMARY OF THE RESULTS

- The first school enrolment of children is delayed in Pakistan. But after enrolment, school participation decreases by the increase in the age of the child.
- In the schooling of children, there exists a very pronounced gender gap in favour of boys.
- Boys are more likely to go to school and work simultaneously than girls, and they do it to support their education. Similarly, boys are more likely to engage in work than are girls.
- The current number of years of education of children decreases the probability for work but increases the probability to combine school with work.
- The head of the household (father and mother of the household) of school-going children has a much higher level of education as compared to the other three categories of children (combining school and work, work-only, and no-school, no-work).
- Average numbers of years of education of the head of the household (father and mother in the household) producing child labour is the lowest in relation to that of their counterparts.
- The head of the household (father and mother of the household) whose children go to school has a higher level of income as compared to the income of those whose children are involved in other categories.

- The head of the household (father and mother) in the child labour-producing households has the lowest level of income in relation to households whose children are involved in other activities.
- The school-going children belong to households with the highest per capita household income, while child labour comes from households with the lowest per capita income.
- The children from female-headed households are more likely to go to school. Therefore, it follows that women are good managers of households and have a good approach towards education.
- Education of the adults in the households, particularly mothers, has a positive impact on child's schooling. So adult literacy is an important policy option for the elimination of child labour.
- Poverty in all its aspects (income of the household, per capita household income, and ownership of assets) is the major cause of low school participation and high level of child labour force participation. Poverty alleviation is a good policy option for increasing school participation and decreasing child labour.
- The school-going children belong to the smallest families and home-care children belong to the largest families in all categories of children.
- As concerns the composition of the household, the school-going children come from families in which the number of children (up to the age of 15) is the lowest in all categories of children, while home-care children come from families having the highest number of such children.
- Large family size reduces the probability for the children to go to school. Population planning is a good tool for increasing enrolments.
- Rural or urban locality of the household also has an impact on the schooling decision of the children. The children from an urban locality are more likely to go to school as compared to those from a rural locality. The elimination of rural-urban disparity and the provision of educational facilities and incentives for schooling in the rural areas are recommended.

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